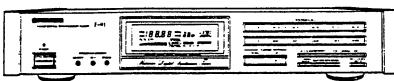


Service Manual



ORDER NO.
ARP 1465

FM/AM DIGITAL SYNTHESIZER TUNER

F-91 Original

MODEL F-91 COMES IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Power requirement	Export destination
KU/CA	AC120V only	U.S.A and Canada
HE	AC220V, 240V (switchable) *	European continent
HB	AC220V, 240V (switchable) *	United Kingdom
SD/G	AC110V, 120V-127V, 220V, 240V (switchable)	U.S.Military
HEZ	AC220V, 240V (switchable) *	West Germany

* Change the primary wiring of the power transformer.

- This service manual is applicable to the KU/CA, HE, HB, SD/G and HEZ types.
- As to the HE, HB, SD/G and HEZ types, please refer to pages P39-P40.
- Ce manuel pour le service comprend les explications en français de réglage. (P28-P29)
- Este manual de servicio trata del método ajuste escrito en español. (P30-P31)

CONTENTS

1. SPECIFICATIONS.....	2	8. PACKING	32
2. PANEL FACILITIES.....	3	9. IC INFORMATION.....	33
3. EXPLODED VIEW AND PARTS LIST.....	5	10. BLOCK DIAGRAM	35
4. SCHEMATIC DIAGRAM	9	11. CIRCUIT DESCRIPTION	37
5. P.C.BORDS CONNECTION DIAGRAM	13	12. FOR HE, HB, HEZ AND SD/G TYPES.....	39
6. ELECTRICAL PARTS LIST	22		
7. ADJUSTMENTS	26		
RÉGLAGE	28		
AJUSTE.....	30		

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1. SPECIFICATIONS

FM Tuner Section

Frequency range	87.5 MHz to 108 MHz
Usable Sensitivity	Mono; 9.8 dBf, IHF (0.85 μ V/75 Ω)
50 dB Quieting Sensitivity	
U.S. and Canadian models	Mono; 12.8 dBf, IHF (1.2 μ V/75 Ω) Stereo; 34.8 dBf, IHF (15 μ V/75 Ω)
U.K. and other destination's models	Mono; 15.3 dBf, IHF (1.6 μ V/75 Ω) Stereo; 35.9 dBf, IHF (17 μ V/75 Ω)
Sensitivity (DIN)	Mono; 0.75 μ V/75 Ω Stereo; 20 μ V/75 Ω
Signal-to-Noise Ratio	
U.S. and Canadian models	Mono; 95 dB (at 80 dBf) Stereo; 88 dB (at 80 dBf)
U.K. and other destination's models	Mono; 95 dB (at 80 dBf) Stereo; 87 dB (at 80 dBf)
Signal-to-Noise Ratio (DIN)	Mono; 77 dB Stereo; 73 dB
Distortion (at 80 dBf)	Mono; 0.015% (100 Hz) 0.009% (1 kHz) 0.02% (10 kHz) Stereo; 0.02% (100 Hz) 0.02% (1 kHz) 0.07% (10 kHz)
Capture Ratio	0.8 dB
Alternate Channel Selectivity	85 dB (400 kHz)
Stereo Separation	65 dB (1 kHz) 55 dB (20 Hz to 10 kHz)
Frequency Response	+0.2 dB (20 Hz to 15 kHz) -0.8
Image Response Ratio	70 dB
IF Response Ratio	100 dB
AM Suppression Ratio	70 dB
Spurious Response Ratio	80 dB
Subcarrier Product Ratio	60 dB
Muting Threshold	25.2 dBf (5 μ V/75 Ω)
Antenna Input	75 unbalanced

AM Tuner Section

Frequency range	531 kHz to 1602 kHz (Step 9 kHz) 530 kHz to 1700 kHz (Step 10 kHz)
Sensitivity (IHF, Loop antenna)	150 μ V/m
Selectivity	40 dB
Signal-to-Noise Ratio	50 dB
Image Response Ratio	40 dB
IF Response Ratio	60 dB
Antenna	Loop Antenna

Audio Section

Output (Level/Impedance)	
FM (100% MOD) FIXED	650 mV/0.9 k Ω
AM (30% MOD) FIXED	150 mV/0.9 k Ω

Miscellaneous

Power Requirements	
U.S. and Canadian models	AC120V, 60 Hz
U.K. model	a.c.240V-, 50/60 Hz
Other destination's models	AC110V/120-127V/220V/240V (switchable), 50/60 Hz
Power Consumption	25W
Dimensions	457 (W) x 85 (H) x 316 (D) mm 18 (W) x 3-3/8 (H) x 12 - 7/16 (D) in
Weight (without package)	5.2 kg (11 lb 8 oz)

Furnished Parts

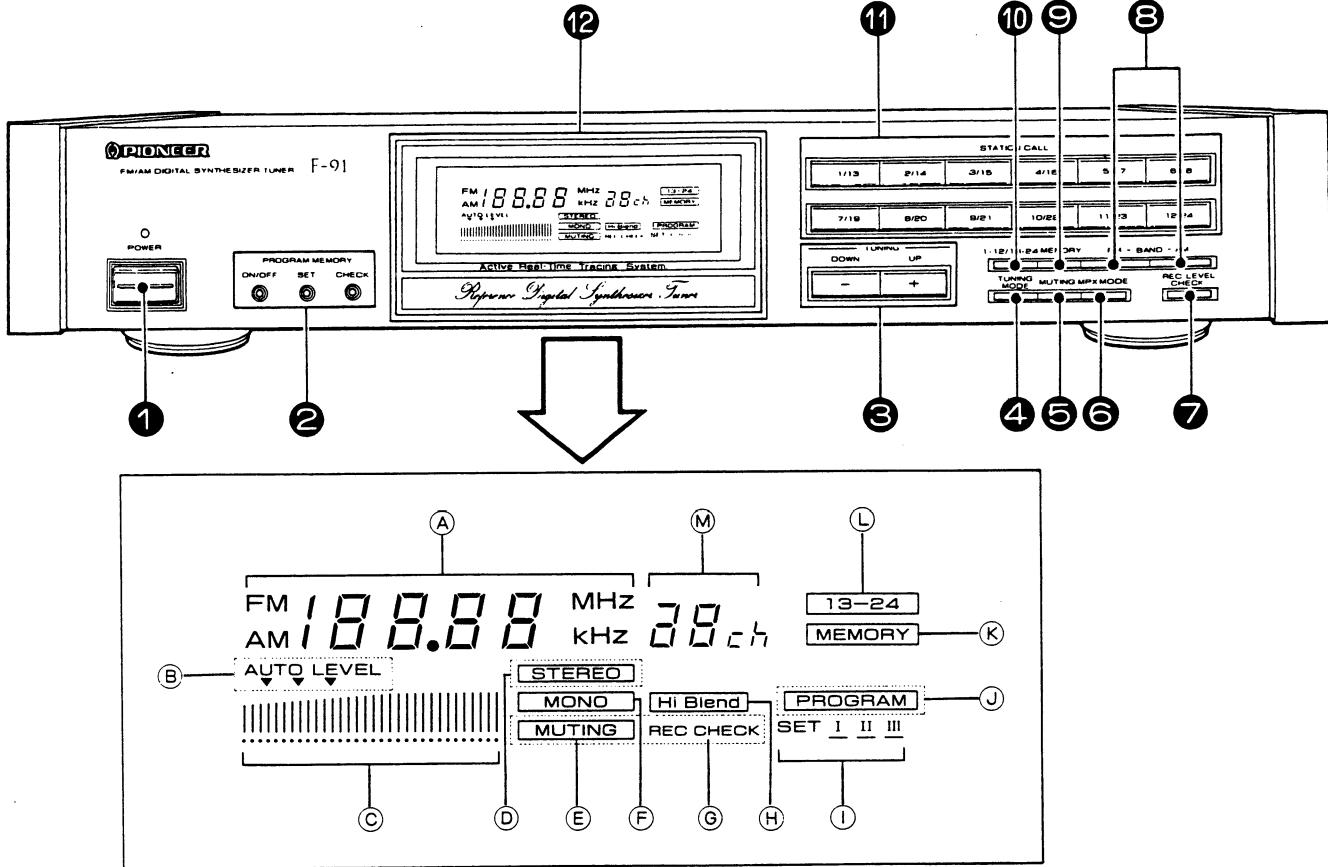
FM T-type Antenna	1
AM Loop Antenna	1
Connecting Cord with Pin Plugs	1
Antenna adaptor *	1
Control cord *	1
Operating Instructions	1

* Not attached on U.K. model.

NOTE:

Specifications and design subject to possible modification without notice due to improvements.

2. PANEL FACILITIES



1 POWER switch/Indicator

- Press to turn power on on
- Press again to turn power off off

2 PROGRAM MEMORY buttons

Convenient for programmed recording.

ON/OFF:

Set to ON, and the three memorized stations will be recalled in sequence as power is turned off and on again.

SET:

Press to set the program memory contents.

CHECK:

Press to confirm the program memory contents.

3 TUNING UP/DOWN switches

Use these switches to tune in broadcasting stations. Press UP (+) to receive a station whose frequency is higher than the displayed frequency, and DOWN (-) to tune in to a lower frequency station.

4 TUNING MODE switch

To select the tuning mode. It changes each time the switch is pressed:

→ MANUAL:

Frequency changes by one step each time one of the TUNING UP/DOWN switches is pressed. When the switch is held depressed the frequency will change continuously.

— AUTO LEVEL indicator off

AUTO 1:

Press one of the TUNING UP/DOWN switches once. The unit will automatically scan the frequency band and stop when it finds a station (a too weak signal station will be ignored). In this case use MANUAL tuning mode.

— [▼] AUTO LEVEL indicator lights up

AUTO 2:

Tuning will stop at stations with more than medium signal strength.

— [▼] AUTO LEVEL indicator lights up

AUTO 3:

Tuning will only stop at strong signal stations.

— [▼] AUTO LEVEL indicator lights up

5 MUTING switch

The muting circuit is designed to remove the typical FM interstation noise generated when moving away from in-tune frequencies, but it can also prevent reception of distant or weak signal stations. In this case, press the MUTING switch off and tune into the desired station. Normally, leave this switch on (MUTING indicators lit).

This switch does not affect AM reception.

NOTE:

The setting of this switch is memorized together with the station in the station memory.

6 MPX (multiplex) MODE switch

Mode changes as follows each time this switch is pressed:

STEREO:

For listening to FM stereo broadcasts (the indicator lights up, when a stereo broadcast is received. The indicator also lights, when a stereo broadcast is received in Hi-Blend Mode.).

— [STEREO] indicator lights up

STEREO

MONO:

To receive stereo broadcasts in monaural.

— [MONO] indicator lights up

MONO

Hi-Blend:

Select this position when the stereo signal is noisy. High frequencies will be blended, improving sound quality.

— [Hi-Blend] indicator lights up

Hi Blend

NOTE:

The setting of this switch is memorized together with the station in the station memory.

7 REC LEVEL CHECK switch

To set the tape deck recording level when recording FM broadcasts. Press this switch on (the REC CHECK indicator will start flashing), and an FM recording standard level signal (frequency: approx. 330 Hz; level: equivalent to 50% modulation FM) will be continuously delivered from the OUTPUT jacks. Adjust the tape deck level meter reading to approx. -2 dB to obtain an appropriate recording level. Always press this switch off after setting the recording level (the REC CHECK indicator will go off).

**8 BAND selector switches****FM:**

Press to receive FM broadcasts.

AM:

Press to receive AM broadcasts.

9 MEMORY switch

Press to memorize preset stations.

The [MEMORY] indicator will remain lit for about 5 seconds. Press the desired STATION CALL switch to memorize it during this period.

MEMORY

10 [1-12/13-24] Station call selector switch

Use this selector to choose between channels 1-12 and 13-24 when memorizing station frequencies or recalling already stored stations. The [13-24] indicator lights up when channels 13-24 are selected.

13-24

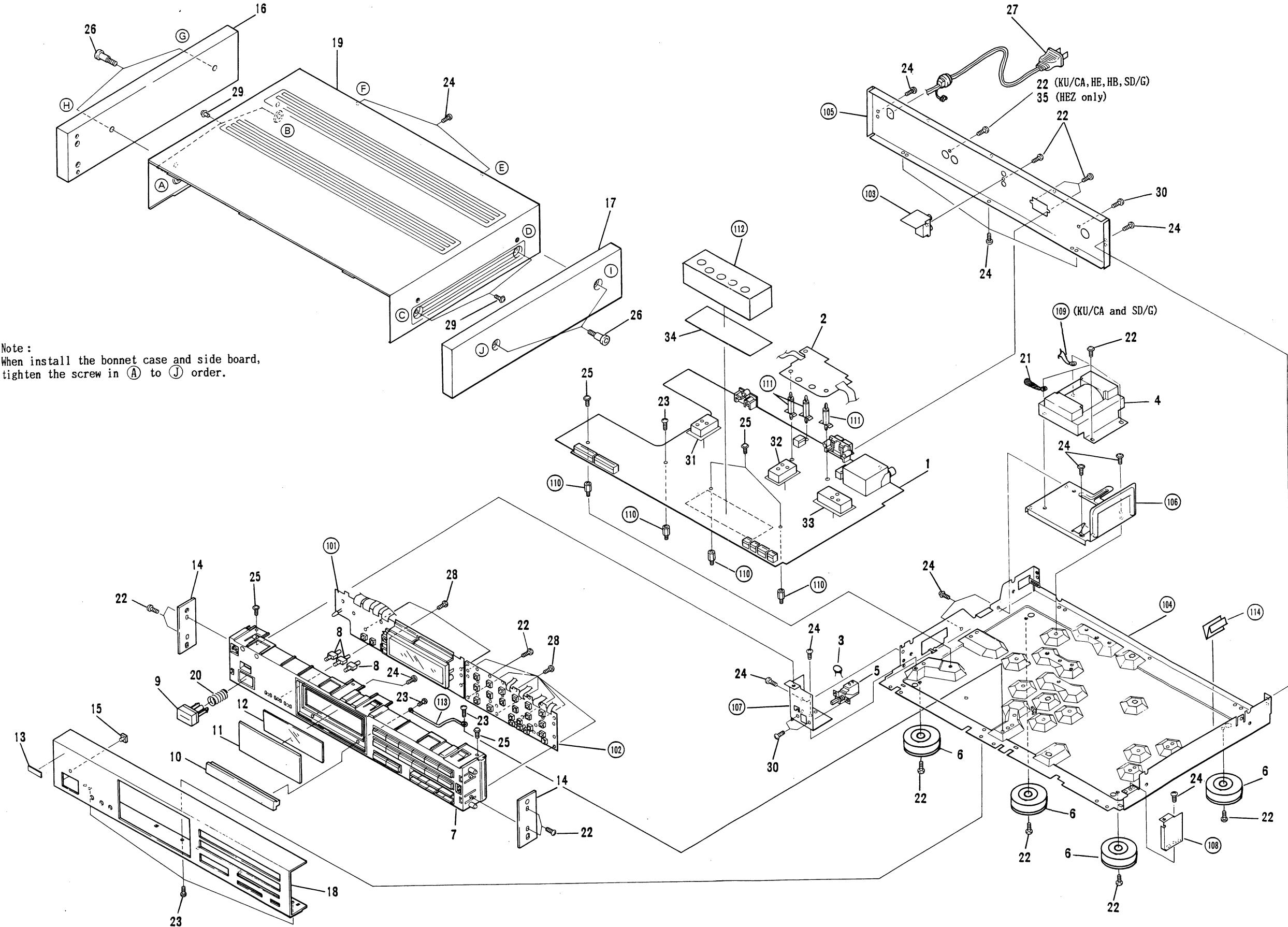
11 STATION CALL switches

Use these switches to preset stations and to receive already preset stations.

12 Operation Display

- (A) Shows reception band and frequency.
- (B) When the TUNING MODE switch is set to AUTO 1-3, the mark ▼ above the signal indicator indicates the level set for automatic tuning.
- (C) Signal indicator
- (D) Lights up when a stereo broadcast is received.
- (E) Stays lit while muting is occurring.
- (F) Stays lit while the MPX MODE switch is set to MONO.
- (G) Flashes when the REC LEVEL CHECK switch is set to on.
- (H) Stays lit while the MPX MODE switch is set to Hi-Blend.
- (I) Shows the condition of the program memory mode.
- (J) Stays lit while the PROGRAM MEMORY ON/OFF switch is on.
- (K) Lights for about 5 seconds when the MEMORY switch is pressed.
- (L) Lights up when the station call selector switch is set to 13-24.
- (M) When a STATION CALL switch is pressed, it will show the corresponding channel number.

3. EXPLODED VIEW AND PARTS LIST



Parts Li
Mark No

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▲★
▲★★

Extern

RN1
RN2

E

A

NOTES:

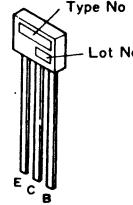
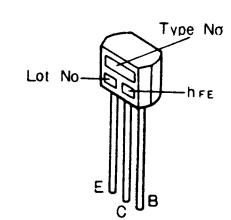
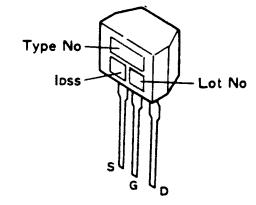
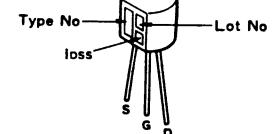
- Parts without part number cannot be supplied.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your parts Stock Control, the fast moving items are indicated with the marks $\star\star$ and \star .
- $\star\star$ GENERALLY MOVES FASTER THAN \star
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- Parts marked by (\odot) are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

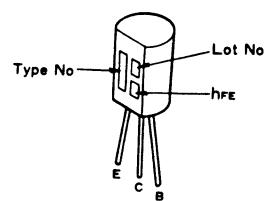
Mark	No.	Part no.	Description	Mark	No.	Part no.	Description
	1	AWZ1568	TUNER assembly		25	ABA1011	Screw
	2	AWZ1570	AM assembly		26	ABA1032	Screw
Δ	3	ACE-501	Ceramic capacitor (0.01 μ F/AC250V, C409)	Δ	27	ADG-088	AC power cord
$\Delta \star$	4	ATT1043	Power transformer (T901)		28	BBZ26P080FMC	Screw
$\Delta \star\star$	5	ASG-541	Push switch (POWER, S901)		29	FBT40P080FZK	Screw
	6	AMR1047	Leg assembly		30	VMZ30P060FCU	Screw
	7	AMB1222	Panel base assembly		31	AWZ1576	DET VCO assembly
	8	AAD1190	Tact knob B (PROGRAM MEMORY)		32	AWZ1577	IF VCO assembly
	9	AAD1197	Power knob (POWER)		33	AWZ1580	FRONT END OSC assembly
	10	AAH1029	Aluminum sash		34	AWZ1579	IF MODULE assembly
	11	AAK1298	Acrylic panel		35	ABA1035	Screw (HEZ only)
	12	AAK1300	FL filter				FL assembly
	13	AAM1001	Name plate				SW assembly
	14	AAP1064	Side sash				REMOCON assembly
	15	AMR1160	LED lens				Chassis
	16	AMS1015	Side board L				Rear panel
	17	AMS1016	Side board R				Transformer frame
	18	ANB1128	Front panel				Front panel holder A
	19	ANE1087	Bonnet case				Front panel holder B
	20	ABH1033	Coil spring A				Earth lead
	21	AEC-093	Binder				PCB holder
	22	ABA-298	Screw				
	23	ABA1006	Screw				
	24	ABA1009	Screw				
							PCB support
							Shield cover
							Earth lead
							Earth leader

B

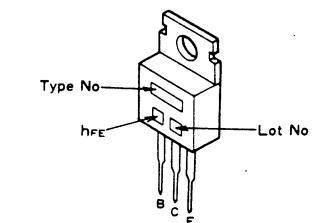
External Appearance of Transistor and ICs

RN1203
RN22012SC2603
2SA11152SK241
2SK1612SJ103
2SK246

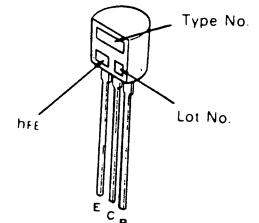
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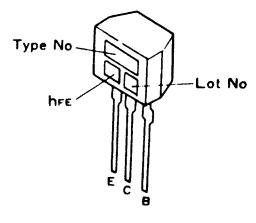
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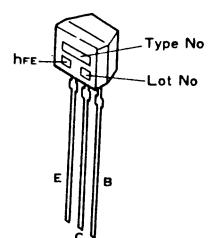
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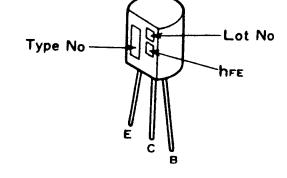
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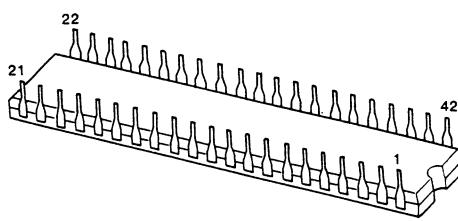
2SC2786



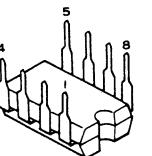
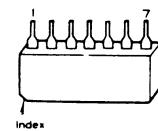
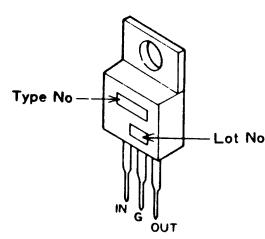
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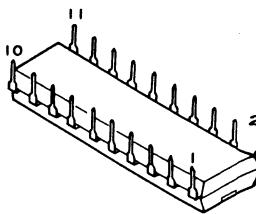
LC7570



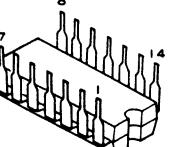
M5218P

 μ PC1163H μ PC78M05H

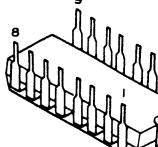
LA1247



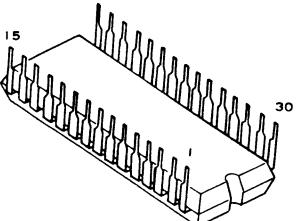
NJH1496D



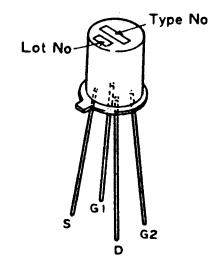
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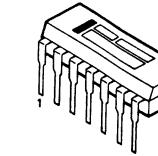
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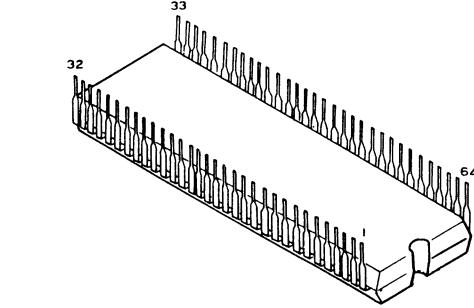
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CX-7925B

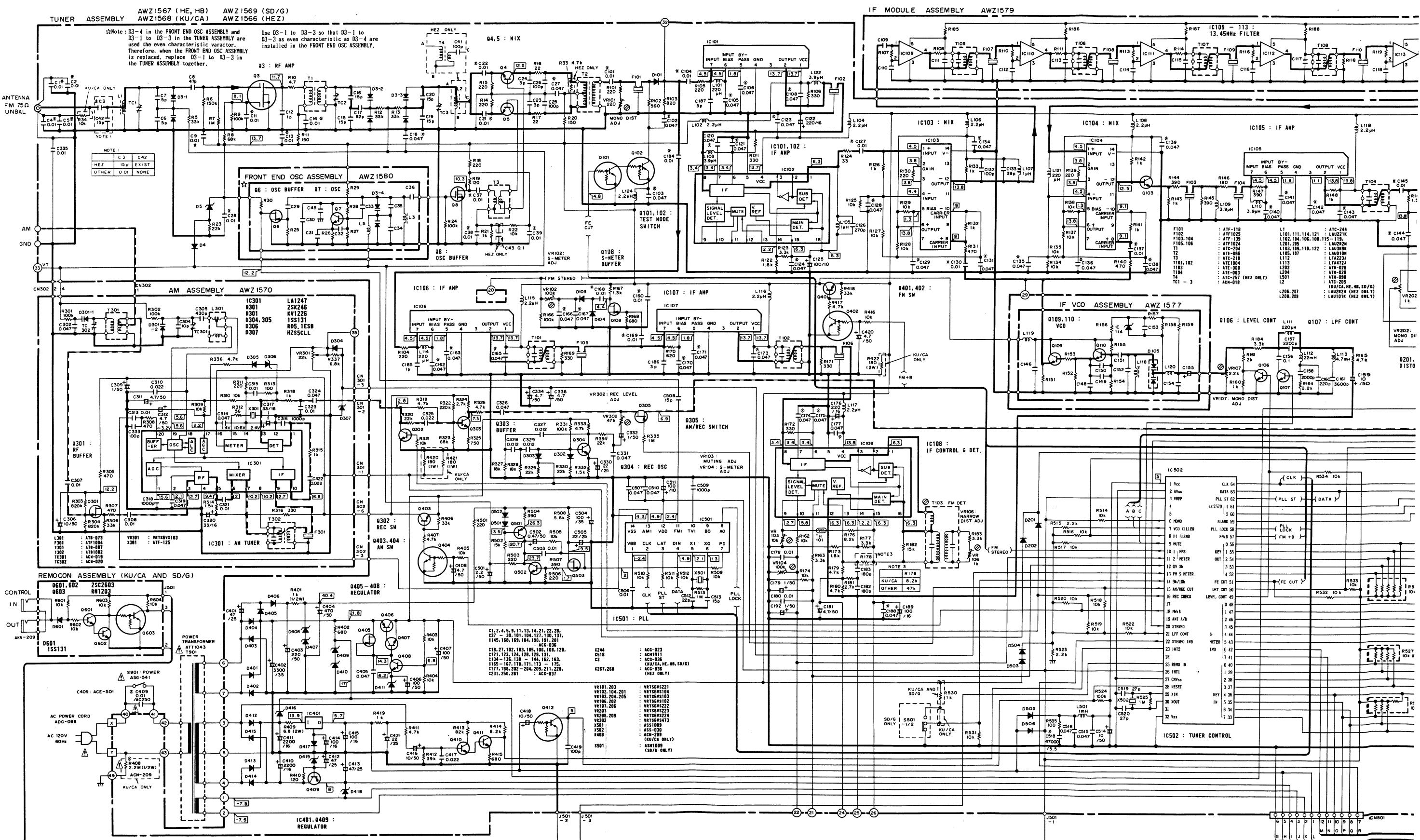


PD5056



D

4. SCHEMATIC DIAGRAM



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5. P.C. BOARDS CONNECTION DIAGRAM

ANZ1568 (KU/CA) ANZ1566 (HEZ)
 TUNER ASSEMBLY ANZ1567 (HE,HB) ANZ1569 (SD/G)

C401 :
0.01/AC250

AC120V
60Hz

Q405 Q406
Q407 Q408
Q409 Q410 Q411 IC401

Q205

IC203

Q204 Q211 Q202
Q203 Q202 Q201
IC502 Q205 Q104 Q105

VR205 VR204 VR208
VR201 VR209 VR203
VR202

Q305 Q107
Q106 Q103 Q108
IC105 IC103 IC104

VR302
VR102 VR104
VR103 VR104

VR207 VR206
VR106 VR107
VR101

Q302 Q303 Q108 Q304
IC106 IC101 IC102
IC103 Q401 Q402 IC501

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Q5 Q3 Q8
Q402 Q502
Q501

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IC101 IC102
IC103 Q401 Q402 IC501

Q107

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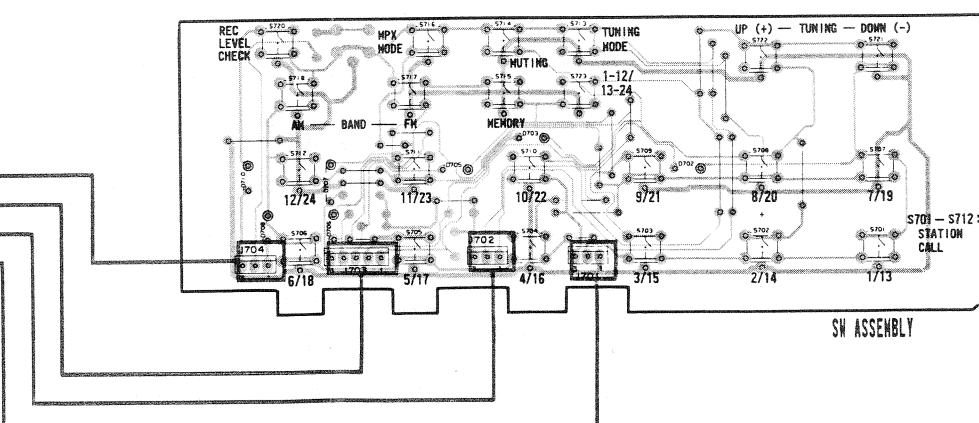
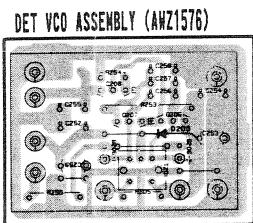
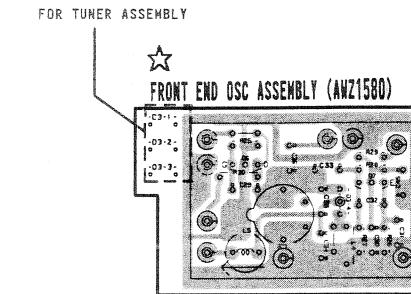
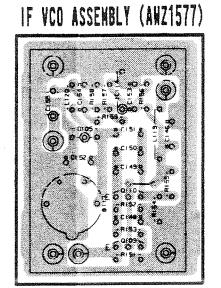
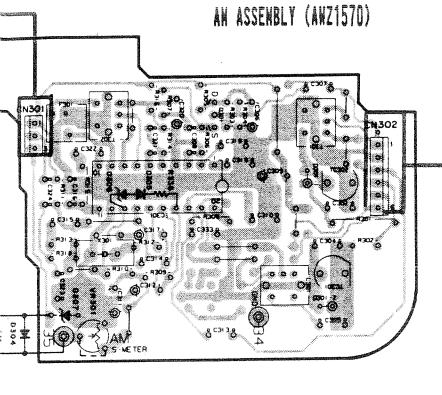
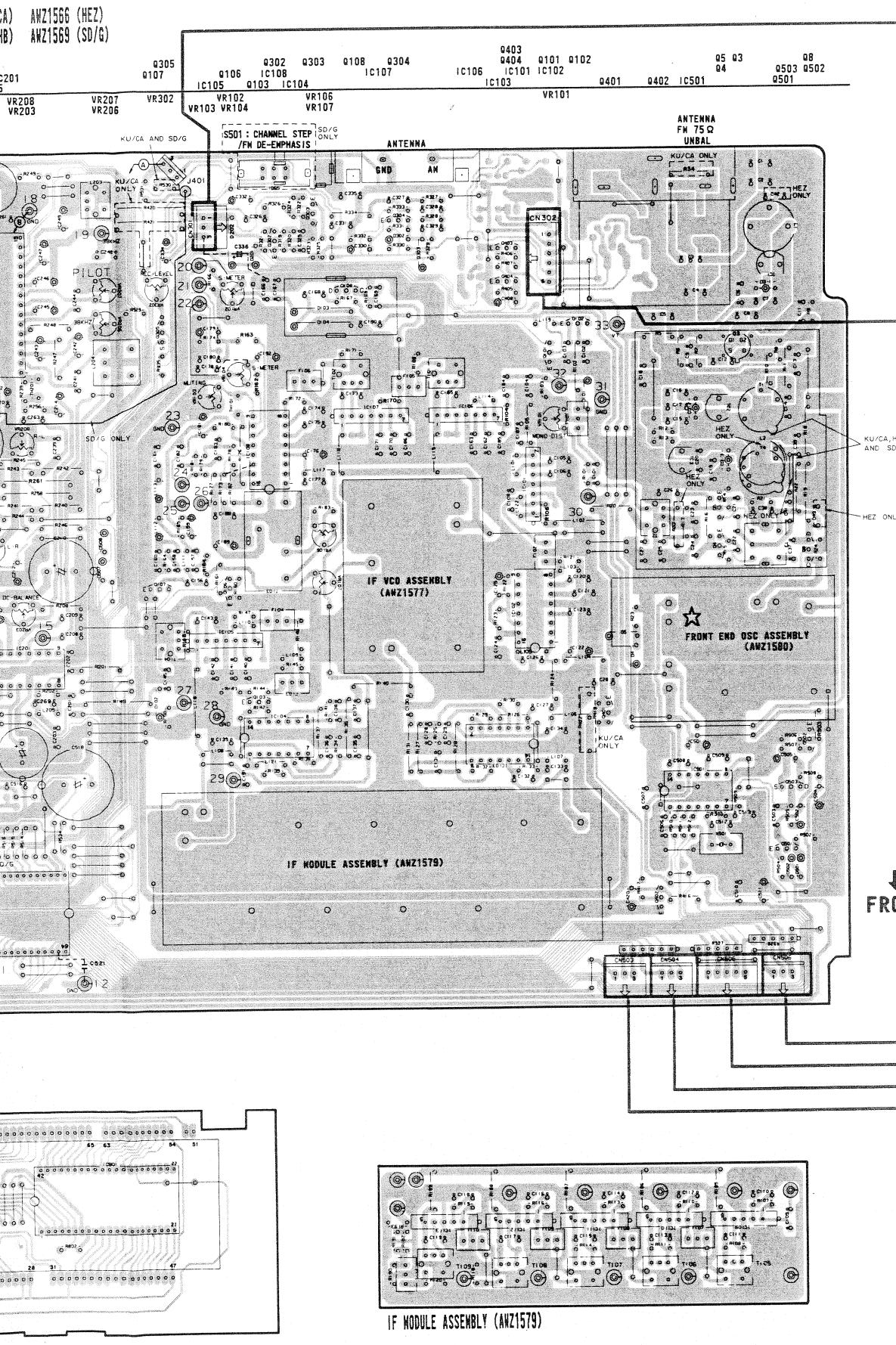
Q403 Q404 Q101 Q102
Q5 Q3 Q8
Q402 Q502
Q501

RENOCON ASSEMBLY
(KU/CA AND SD/G)

OUT
CONTROL
IN

FRONT

→



☆Note: D3-4 in the FRONT END OSC ASSEMBLY and D3-1 to D3-3 in the TUNER ASSEMBLY are used the even characteristic varactor. Therefore, when the FRONT END OSC ASSEMBLY is replaced, replace D3-1 to D3-3 in the TUNER ASSEMBLY together. Use D3-1 to D3-3 so that D3-1 to D3-3 as even characteristic as D3-4 are installed in the FRONT END OSC ASSEMBLY.

NOTE

1. This P.C.B connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the following Table.

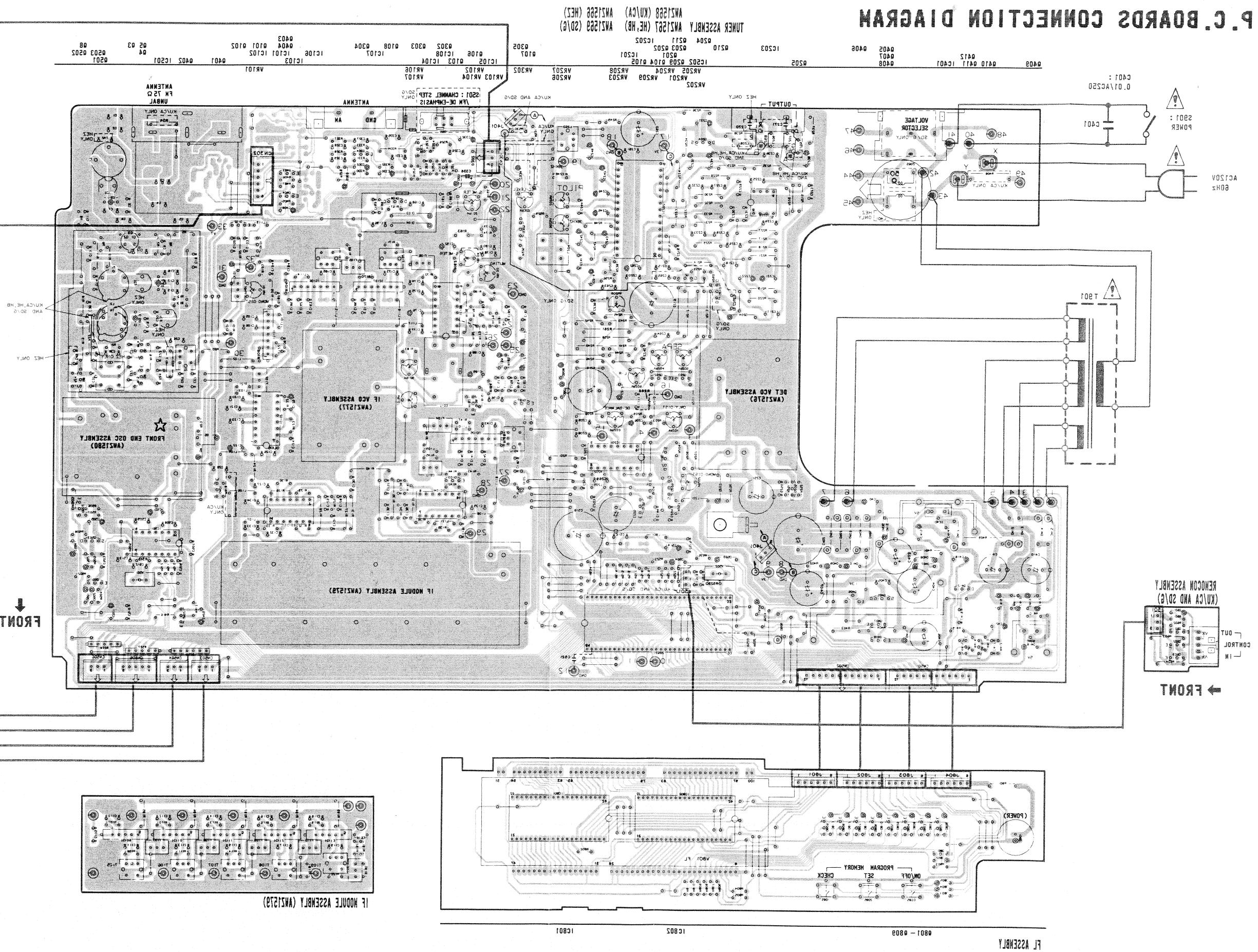
P.C.B. pattern diagram indication	Corresponding part symbol	Part Name
OS04	EO O O	Transistor
Q215	EO O O	Radiator type transistor
D203	O O	Diode
R237	W W	Resistor
C513	O +	Capacitor (Polarity)
C518	O || O	Capacitor (Non-polarity)

Others

P.C.B. pattern diagram indication	Part Name
IC	IC
S	Switch
RY	Relay
L	Coil
F	Filter
VR	Variable resistor or Semi-fixed resistor

3. The capacitor terminal marked with (double circles) shows negative terminal.
4. The diode terminal marked with (double circles) shows cathode side.
5. The transistor terminal to which E is affixed shows the emitter.

P.C. BOARDS CONNECTION DIAGRAM



6. ELECTRICAL PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "◎" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.
- ★★ GENERALLY MOVES FASTER THAN ★
- This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.
- Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).
 560Ω 56 \times 10¹ 561 RD1/4PS561J
 47kΩ 47 \times 10³ 473 RD1/4PS473J
 0.5Ω 0R5 RN2H0R5K
 1Ω 010 RS1P010K
 Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
 5.62kΩ 562 \times 10¹ 5621 RN1/4SR5621J

Miscellaneous Parts

Mark	Symbol & Description	Part No.
	REMOCON assembly	
	FL assembly	
	TUNER assembly	AWZ1568
	SW assembly	
	AM assembly	AWZ1570
	DET VCO assembly	AWZ1576
	IF VCO assembly	AWZ1577
	FRONT END OSC assembly	AWZ1580
	IF MODULE assembly	AWZ1579
△	C409 Ceramic capacitor (0.01/AC250V)	ACE-501
△	L901 Loop antenna assembly	ATB-086
△★	T901 Power transformer	ATT1043
△★★	S901 Push switch (POWER)	ASG-541
△	AC power cord	ADG-088
REMOCON Assembly		
SEMICONDUCTORS		
Mark	Symbol & Description	Part No.
★★	Q603	RN1203
★★	Q601, Q602	2SC2603
★	D601	ISS131
RESISTORS		
Mark	Symbol & Description	Part No.
	R601-R604	RD1/8PM103J
OTHERS		
Mark	Symbol & Description	Part No.
	2P Mini jack (CONTROL)	AKN-209

TUNER Assembly (AWZ1568)

SEMICONDUCTORS		Part No.	SEMICONDUCTORS		Part No.	CAPACITORS		Part No.
Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
★★	TH101, TH201 Thermistor	TH103-2	★★	L103, L109, L110, L122	LAU3R9K	C5		
★★	IC501	CX-7925B	★★	Axial inductor		C5		
★★	IC203	M5218P	★★	L112 Inductor	LTA223J	C1'		
★★	IC103, IC104	NJM1496D	★★	L113 Inductor	LTA472J	C2		
★★	IC202	PA5007	★★	F101 FM Ceramic filter	ATF-118	C1'		
★★	IC102, IC108, IC201	PA5008	★★	F103, F104 FM IF filter	ATF-139	C4		
★★	IC502	PD5056	★★	F105, F106 Ceramic filter	ATF1024	C1		
★★	IC101, IC105-IC107	μPC1163H	★★	F102 FM IF filter	ATF1025	C4		
★★	IC401	μPC78M05H	★★	T1 FM RF transformer	ATC-204	C5		
★★	Q3	P001	★★	T3 FM Balun transformer	ATC-218	C2		
★★	Q101, Q105, Q402, Q404, Q412	RN1203	★★	T104 FM Matching transformer	ATE-063	C1'		
★★	Q102, Q104	RN2201	★★	T2 FM IF transformer	ATE-066	C4		
★★	Q403, Q501	2SA1115	★★	T103 FM Detector transformer	ATE-068	C4		
★★	Q401	2SB560	★★	T101, T102 FM Matching transformer	ATE1004	C1'		
★★	Q406, Q409	2SB834	★★	Q205	2SC2389	C2		
★★	Q302-Q304, Q407, Q408, Q410, Q411, Q502	2SC2603	★★	Q302-Q304, Q407, Q408, Q410, Q411, Q502	2SC2603	C24		
★★	Q103	2SC2668	★★	Q103	2SC2668	C25		
★★	Q4, Q5	2SC2786	★★	Q4, Q5	2SC2786	C40		
★★	Q106, Q107, Q202, Q203	2SC2878	★★	Q106, Q107, Q202, Q203	2SC2878	C21		
★★	Q201	2SJ103	★★	Q201	2SJ103	C1		
★★	Q8, Q108	2SK241	★★	Q8, Q108	2SK241	C20		
★★	Q204, Q209, Q305, Q405, Q503	2SK246	★★	Q204, Q209, Q305, Q405, Q503	2SK246	C17		
★★	D411	HZS6C2L	★★	D411	HZS6C2L	C40		
★	D409, D410, D416	HZS9A3L	★	D409, D410, D416	HZS9A3L	C21		
★	D408	RD13BB	★	D408	RD13BB	C22		
★	D407	RD15EB	★	D407	RD15EB	C22		
★	D418	RD2.2ESB	★	D418	RD2.2ESB	C15		
★	D5	RD7.5EB	★	D5	RD7.5EB	C32		
★	D419	RD8.2ESB	★	D419	RD8.2ESB	C32		
★	D203, D204	RD8.2FB	★	D203, D204	RD8.2FB	C23		
★	D412-D415, D417, D506	S5566	★	D412-D415, D417, D506	S5566	C20		
★	D4, D201, D202, D302, D303, D501-D505, D507, D508	ISS131	★	D4, D201, D202, D302, D303, D501-D505, D507, D508	ISS131	C44		
★	D101, D102	1SS85	★	D101, D102	1SS85	C41'		
★	D401-D406	10DF2FD	★	D401-D406	10DF2FD	C33		
★	D103, D104	2-1K261	★	D103, D104	2-1K261	C50'		
COILS, FILTERS AND TRANSFORMERS			COILS, FILTERS AND TRANSFORMERS			COILS, FILTERS AND TRANSFORMERS		
Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.	Mark	Symbol & Description	Part No.
L2	FM RF Coil	ATC-205	L2	FM RF Coil	ATC-205	C182, C183		
L1	FM ANT Coil	ATC-244	L1	FM ANT Coil	ATC-244	C160		
L501	Inductor (1mH)	ATH-098	L501	Inductor (1mH)	ATH-098	C126		
L203	Coil (38kHz)	ATM-026	L203	Coil (38kHz)	ATM-026	C133		
L204	Coil (19kHz)	ATM-028	L204	Coil (19kHz)	ATM-028	C12		
L105, L107	Axial inductor	LAU010M	L105, L107	Axial inductor	LAU010M	C23, C24		
L102, L104, L106, L108, L115-L117, L123, L124, L201, L205	Axial inductor	LAU2R2M	L102, L104, L106, L108, L115-L117, L123, L124, L201, L205	Axial inductor	LAU2R2M	C508, C513		
L101, L111, L114, L121	Axial inductor	LAU221K	L101, L111, L114, L121	Axial inductor	LAU221K	C512, C519, C520		
						C8		
						C25, C26		
						C6, C7		
						C15, C16, C19, C20		
						C333		
						C17		

TUNER Assembly (AWZ1568)
SEMICONDUCTORS
Mark **Symbol & Description**
Part No.
Mark **Symbol & Description**
Part No.
★★ TH101, TH201 Thermistor
TH103-2
CX-7925B
L103, L109, L110, L122 Axial inductor
LAU3R9K
★★ IC501
M5218P
L112 Inductor
LTA223J
★★ IC203
NJM1496D
L113 Inductor
LTA472J
★★ IC103, IC104
PA5007
F101 FM Ceramic filter
ATF-118
★★ IC202
PA5008
F103, F104 FM IF filter
ATF-139
★★ IC502
PD5056
F105, F106 Ceramic filter
ATF1024
★★ IC101, IC105-IC107
μPC1163H
F102 FM IF filter
ATF1025
★★ IC401
μPC78M05H
T1 FM RF transformer
ATC-204
★★ Q3
P001
T3 FM Balun transformer
ATC-218
★★ Q101, Q105, Q402, Q404, Q412
RN1203
T104 FM Matching transformer
ATE-063
★★ Q102, Q104
RN2201
T2 FM IF transformer
ATE-066
★★ Q403, Q501
2SA1115
T103 FM Detector transformer
ATE-068
★★ Q401
2SB560
T101, T102 FM Matching transformer
ATE1004
★★ Q406, Q409
2SB834
FM Matching transformer

CAPACITORS
Mark **Symbol & Description**
Part No.
★★ Q205
2SC2389

★★ Q302-Q304, Q407, Q408, Q410,
2SC2603

Q411, Q502
2SC2668
TC1-TC3 Trimmer
ACM-018
★★ Q4, Q5
2SC2786
C244 (390p/DC50V)
ACG-023
★★ Q106, Q107, Q202, Q203
2SC2878
C1-C5, C9, C11, C13, C14, C21,
ACG-036
★★ Q201
2SJ103
C22, C28, C37-C39, C101, C104,

★★ Q8, Q108
2SK241
C127, C130, C137, C145, C168,

★★ Q204, Q209, Q305, Q405, Q503
2SK246
C169, C184, C190, C191, C201

★ D411
HZS6C2L
C267, C268 (0.01/DC25V)

★ D409, D410, D416
HZS9A3L
C18, C27, C102, C103, C105, C106,
ACG-037
★ D408
RD13EB
C108, C120, C121, C123, C124,

★ D407
RD15EB
C128, C129, C131, C134-C136,

★ D418
RD2, 2ESB
C138-C144, C162, C163,

★ D5
RD7.5EB
C165-C167, C170, C171,

★ D419
RD8, 2ESB
C173-C175, C177, C188,

★ D203, D204
RD8, 2FB
C202-C204, C209, C211, C220,

★ D412-D415, D417, D506
S5566
C231, C250, C261

★ D4, D201, D202, D302, D303,
D501-D505, D507, D508
(0.047/DC25V)

★ D101, D102
1SS85

★ D401-D406
10DP2FD
C187

★ D103, D104
2-1K261
C132, C269, C419, C521

COILS, FILTERS
AND TRANSFORMERS
Mark **Symbol & Description**
Part No.
L2 FM RF Coil
ATC-205

L1 FM ANT Coil
ATC-244

L501 Inductor (1mH)
ATH-098

L203 Coil (38kHz)
ATM-026

L204 Coil (19kHz)
ATM-028

L105, L107 Axial inductor
LAU010M

L102, L104, L106, L108,
LAU2R2M

L115-L117, L123, L124, L201,
L205 Axial inductor
L101, L111, L114, L121
Axial inductor

LAU221K

AM Assembly (AWZ1570)**SEMICONDUCTORS**

Mark	Symbol & Description	Part No.
★★	IC301	LA1247
★★	Q301	2SK246
★	D301	KV1226
★	D304, D305	ISS131
★	D306	RD5.1ESB
★	D307	HZS5CLL

COIL, FILTER AND TRANSFORMERS

Mark	Symbol & Description	Part No.
	L301 AM OSC Coil	ATB-073
	F301 AM Ceramic filter	ATF1004
	T301 AM Antenna transformer	ATB-087
	T302 AM IF transformer	ATB1002

CAPACITORS

Mark	Symbol & Description	Part No.
	TC301	ACM-019
	TC302	ACM-020
	C304	CCDUJ100D50
	C309	CEAS010M50
	C306	CEAS100M50
	C317, C320	CEAS330M16
	C311, C312	CEAS4R7M50
	C323	CFTXA103J50
	C324	CFTXA473J50
	C316, C318	CKDVF102Z50
	C307, C308, C313, C315, C321	CKDVF103Z50
	C310, C322	CKDVF223Z50
	C302, C314, C319	CKDVF473Z50
	C305	QSA431K50
	C333	CCDSL101J50

RESISTORS

Mark	Symbol & Description	Part No.
★	VR301 Semi-fixed (22kΩ) Other resistors	VRTS6VS223 RD1/8PM□□□J

OTHERS

Mark	Symbol & Description	Part No.
★	X301 Ceramic resonator	ATF-125

DET VCO ASSEMBLY (AWZ1576)**IF VCO ASSEMBLY (AWZ1577)****★FRONT END OSC ASSEMBLY (AWZ1580)****IF MODULE ASSEMBLY (AWZ1579)**

There are not supplied parts above four assemblies.

★Note :

D3-4 in the FRONT END OSC ASSEMBLY and D3-1 to D3-3 in the TUNER ASSEMBLY are used the even characteristic varactor.

Therefore, when the FRONT END OSC ASSEMBLY is replaced, replace D3-1 to D3-3 in the TUNER ASSEMBLY together.

Use D3-1 to D3-3 so that D3-1 to D3-3 as even characteristic as D3-4 are installed in the FRONT END OSC ASSEMBLY.

7. ADJUSTMENTS

AM Section Adjustments

- Wire as shown in Fig. 7-1
- Set the AM key to ON and the REC LEVEL CHECK key to OFF.

Step	AM SG (400Hz, 30% de modulation)		F-91 frequency indication	Adjustment point	Adjustments			
	Frequency	Level			Standard			
1	No signal		530kHz (531kHz) ^{*1}	L301	Adjust so that the voltage between terminal 33 and ground is 2V ($\pm 0.3V$).			
2			1,700kHz (1,602kHz) ^{*1}	TC301	Adjust so that the voltage between terminal 33 and ground is 24.5V ($\pm 0.5V$).			
3	Repeat steps 1 and 2 until both ground voltage standards are satisfied.							
4	Mechanically set VR301 to the midpoint.							
5	600kHz (603kHz) ^{*1}	50 – 80dB	600kHz (603kHz) ^{*1}	T301	Maximize the voltage between terminal 35 and ground.			
6	1,400kHz (1,395kHz) ^{*1}	50 – 80dB	1,400kHz (1,395kHz) ^{*1}	TC302				
7	Repeat steps 5 and 6 until the maximum voltage standard is satisfied in both steps.							
8	600kHz (603kHz) ^{*1}	100dB	600kHz (603kHz) ^{*1}	VR301	Adjust so that the voltage between terminal 35 and ground is 4.9V ($\pm 0.1V$). ^{*2}			

*1: The frequency in the parenthesis is the frequency at 9kHz STEP (HE and HB types).

*2: Do not let the voltage of terminal 35 exceed 5.2V.

FM Section Adjustment

Note: The adjustment method of this FM section is simple throughout.

- Wire as shown in Fig. 7-2
- Set the FM key to ON, and the REC LEVEL CHECK and MUTING keys to OFF.

Step	FM SG (1kHz, ± 75 kHz deviation)		F-91 frequency indication	Adjustment point	Adjustments	
	Frequency	Level			Standard	
1	No signal		108MHz	L3	Adjust so that the voltage between terminal 33 and ground is 23.5V ($\pm 0.2V$).	
2			87.5MHz	...	Confirm that the voltage between terminal 33 and ground is 7.5V ($\pm 1.0V$).	
3	90MHz	40dB	90MHz	L1, T1, L2	Maximize the voltage between terminal 22 and ground.	
4	106MHz	40dB	106MHz	TC1–3		
5	Repeat steps 3 and 4 until both ground voltage standards are satisfied. Terminate the adjustment with step 4.					
6	106MHz	60dB	106MHz	T103—a	Set the voltage to OV for terminal 24 to 26.	
7	98MHz	18dB (Stereo modulation) [*]	98MHz	VR103	Adjust to the point just before muting is applied.	
8	98MHz	40dB	98MHz	—	Check the output level of the output terminal.	
9	Set the REC LEVEL CHECK key to ON.			VR302	At step 8, set the output level of the output terminal to -6 dB (± 1 dB).	

* Stereo modulation: Main 1kHz, L-R, ± 68.25 kHz dev. pilot 19kHz, ± 6.75 kHz dev.

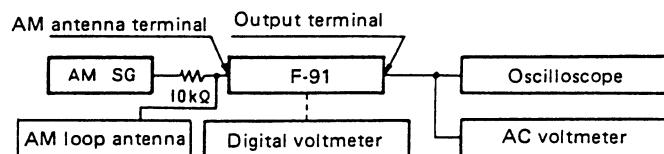


Fig. 7-1 AM adjustment wiring diagram

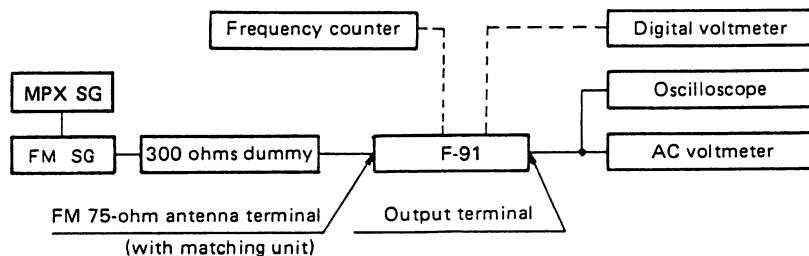


Fig. 7-2 FM adjustment wiring diagram

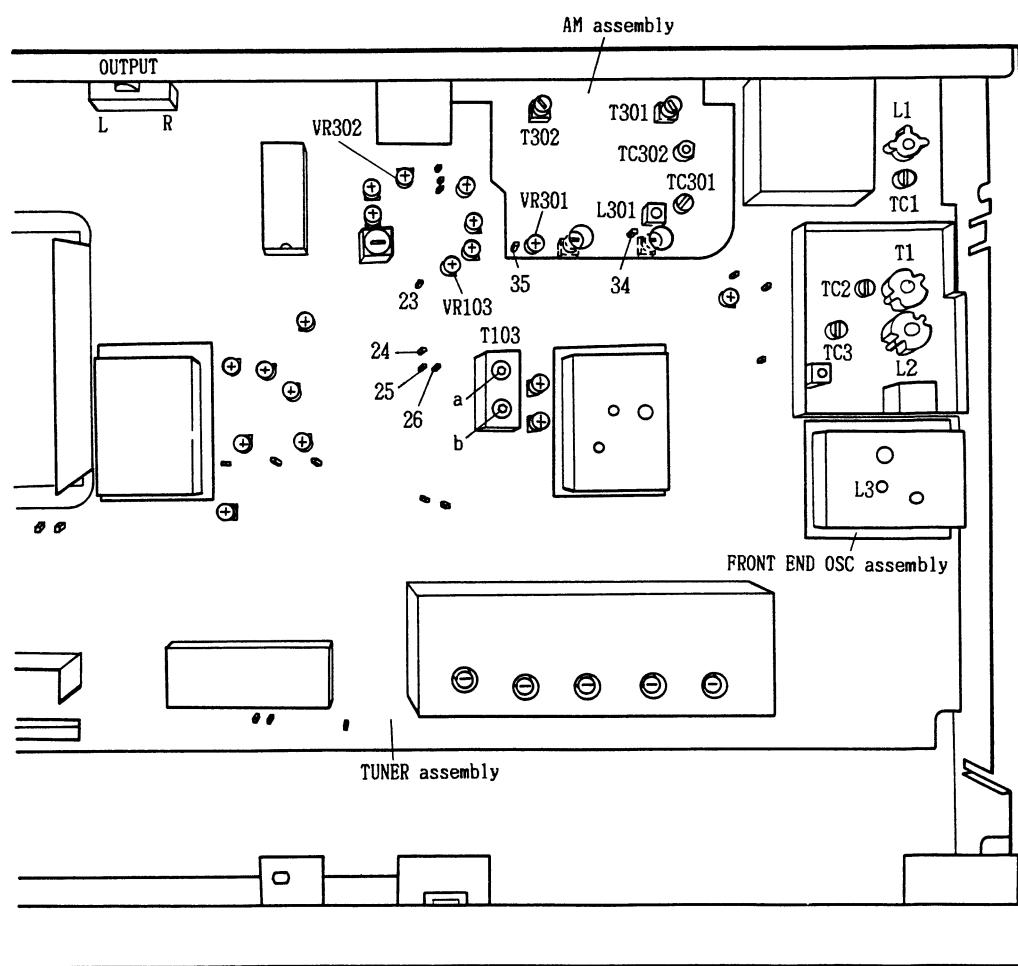


Fig. 7-3 Adjustment point

7. RÉGLAGE

Réglages de la Section AM

- Effectuer le câblage comme indiqué sur la figure 7-1.
- Enclencher la touche AM et désenclencher la touche REC LEVEL CHECK.

Etape	AM SG (400Hz, 30% de modulation)		F-91 indication de fréquence	Point de réglage	Réglages			
	Fréquence	Niveau			Norme			
1	Aucun signal	530kHz (531kHz) ^{*1}	L301	TC301	Régler de telle manière que la tension entre la borne 33 et la terre soit égale à 2V ($\pm 0,3V$).			
2		1.700kHz (1.602kHz) ^{*1}			Régler de telle manière que la tension entre la borne 33 et la terre soit égale à 24,5V ($\pm 0,5V$).			
3	Répéter les étapes 1 et 2 jusqu'à ce que les deux normes de tension de terre soient satisfaites.							
4	Régler mécaniquement VR301 à mi-chemin.							
5	600kHz (603kHz) ^{*1}	50 – 80dB	600kHz (603kHz) ^{*1}	T301	Régler de telle manière que la tension entre la borne 35 et la terre soit au maximum.			
6	1.400kHz (1.395kHz) ^{*1}	50 – 80dB	1.400kHz (1.395kHz) ^{*1}	TC302				
7	Répéter les étapes 4 et 6 jusqu'à ce que la norme de tension maximum soit satisfaire dans les deux étapes.							
8	600kHz (603kHz) ^{*1}	100dB	600kHz (603kHz) ^{*1}	VR301	Régler de sorte que la tension entre la borne 35 et la masse soit de 4,9V ($\pm 0,1V$). ^{*2}			

*1: La fréquence entre les parenthèses est la fréquence à l'intervalle de 9kHz (modèles HE et HB).

*2: Ne pas laisser la tension de la borne 35 dépasser 5,2V.

Réglage de la Section FM

Remarque: La méthode de réglage de cette section FM est simple du début jusqu'à la fin.

- Effectuer le câblage comme indiqué dans la figure 7-2.
- Enclencher la touche FM et désenclencher les touches REC LEVEL CHECK et MUTING.

Etape	FM SG (1kHz, ± 75 kHz de déviation)		Indication de fréquence de F-91	Point de réglage	Réglages	
	Fréquence	Niveau			Norme	
1	Aucun signal	108MHz	L3	...	Régler de telle manière que la tension entre la borne 33 et la terre soit égale à 23,5V ($\pm 0,2V$).	
2		87,5MHz			Vérifier si la tension entre la borne 33 et la terre est égale à 7,5V ($\pm 1,0V$).	
3	90MHz	40dB	90MHz	L1, T1, L2	Régler de telle manière que la tension entre la borne 22 et la terre soit au maximum.	
4	106MHz	40dB	106MHz	TC1–3		
5	Répéter les étapes 3 et 4 jusqu'à ce que les deux normes de tension de masse soit atteintes. Parachever le réglage avec l'étape 4.					
6	106MHz	60dB	106MHz	T103–a	Régler la tension sur 0V pour les bornes 24 à 26.	
7	98MHz	18dB (Modulation stéréo)*	98MHz	VR103	Régler au point situé juste avant que l'assourdissement n'entre en service.	
8	98MHz	40dB	98MHz	—	Vérifier le niveau de sortie de la borne de sortie.	
9	Enclencher la touche REC LEVEL CHECK.			VR302	A l'étape 8, régler le niveau de sortie de la borne de sortie sur -6 dB (± 1 dB).	

* Modulation stéréo: Principale 1kHz, G-D, $\pm 68,25$ kHz dév. pilote 19kHz, $\pm 6,75$ kHz dév.

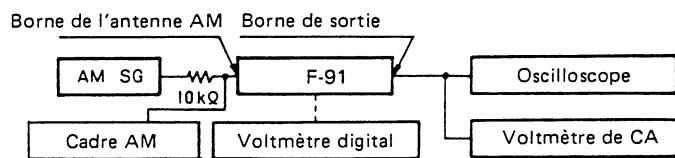


Fig. 7-1 Diagramme de câblage de réglage AM

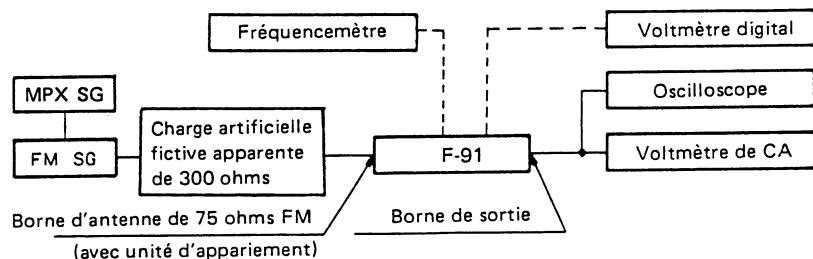


Fig. 7-2 Diagramme de câblage de réglage FM

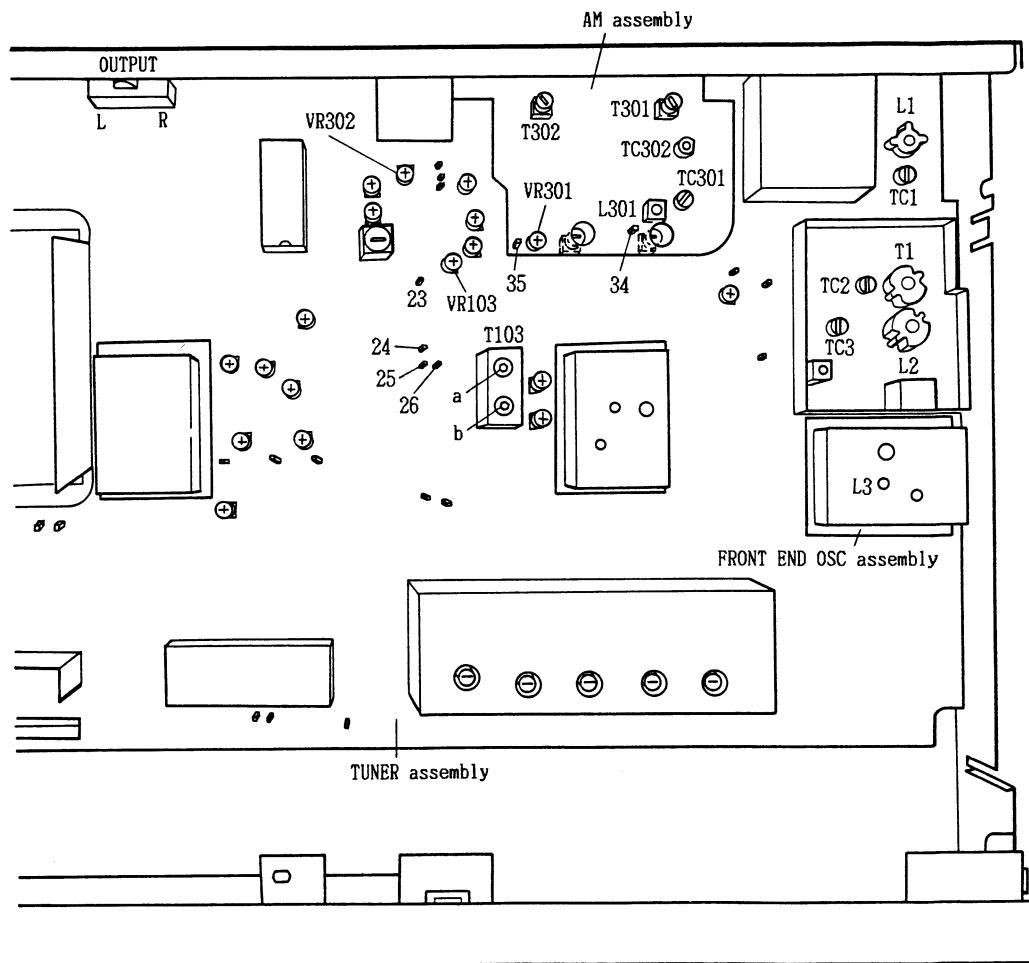


Fig. 7-3 Point de réglage

7. AJUSTE

Ajustes de la Sección AM

- Ejecutar el alambrado como se muestra en la figura 7-1.
- Ponga la tecla AM en ON, y la tecla REC LEVEL CHECK en OFF.

Paso	AM SG (400Hz, 30% de modulación)		F-91 indicación de frecuencia	Punto de ajuste	Ajustes				
	Frecuencia	Nivel			Estándar				
1	Ninguna señal		530kHz (531kHz) ^{*1}	L301	Ajustar de modo que el voltaje entre el terminal 33 y la tierra sea de 2V (±0,3V).				
2			1.700kHz (1.602kHz) ^{*1}	TC301	Ajustar de modo que el voltaje entre el terminal 33 y la tierra sea de 24,5V (±0,5V).				
3	Repetir los pasos 1 y 2 hasta que ambos estándares de voltaje de tierra sean satisfechos.								
4	Ponga VR301 mecánicamente en el punto central.								
5	600kHz (603kHz) ^{*1}	50 – 80dB	600kHz (603kHz) ^{*1}	T301	Ajustar de modo que el voltaje entre el terminal 35 y la tierra sea máximo.				
6	1.400kHz (1.395kHz) ^{*1}	50 – 80dB	1.400kHz (1.395kHz) ^{*1}	TC302					
7	Repetir los pasos 5 y 6 hasta que el estándar de voltaje máximo sea satisfecho en ambos pasos.								
8	600kHz (603kHz) ^{*1}	100dB	600kHz (603kHz) ^{*1}	VR301	Ajuste de forma que la tensión entre el terminal 35 y masa sea de 4,9V (±0,1V). ^{*2}				

*1: La frecuencia entre paréntesis corresponde a 9kHz STEP (modelos HE y HB).

*2: No deje que la tensión del terminal 35 sobrepase los 5,2V.

Ajuste de la Sección FM

Nota: El método de ajuste de esta sección de FM es muy sencillo.

- Ejecutar el alambrado como se muestra en la figura 7-2.
- Ponga la tecla FM en ON, y las teclas REC LEVEL CHECK y MUTING en OFF.

Paso	FM SG (1kHz, ± 75kHz de desviación)		Indicación de frecuencia de F-91	Punto de ajuste	Ajustes	
	Frecuencia	Nivel			Estándar	
1	Ninguna señal		108MHz	L3	Ajustar de modo que el voltaje entre el terminal 33 y la tierra sea de 23,5V (±0,2V).	
2			87,5MHz	...	Verificar si el voltaje entre el terminal 33 y la tierra es de 7,5V (±1,0V).	
3	90MHz	40dB	90MHz	L1, T1, L2	Ajustar de modo que el voltaje entre el terminal 22 y la tierra sea máximo.	
4	106MHz	40dB	106MHz	TC1—3		
5	Repita los pasos 3 y 4 hasta obtener ambos valores de tensión. Termine el ajuste con el paso 4.					
6	106MHz	60dB	106MHz	T103—a	Ajuste la tensión a 0V para los terminales 24 a 26.	
7	98MHz	18dB (Modulación estéreo)*	98MHz	VR103	Ajuste el punto justamente antes de que se aplique el silenciamiento.	
8	98MHz	40dB	98MHz	—	Compruebe el nivel de salida del terminal de salida.	
9	Ponga la llave REC LEVEL CHECK en ON.			VR302	En el paso 8, ajuste el nivel de salida del terminal de salida a –6dB (±1dB).	

* Modulación estéreo: Principal 1kHz, L-R, piloto de ± 68,25kHz de desviación 19kHz, desviación de ± 6,75kHz

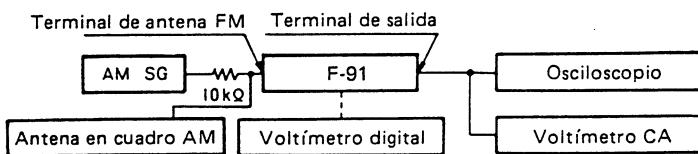


Fig. 7-1 Esquema de alambrado de ajuste AM

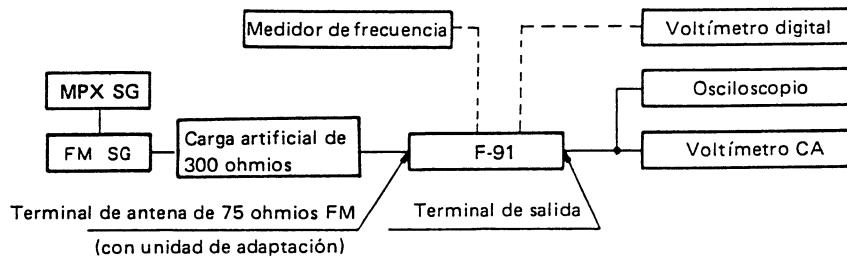


Fig. 7-2 Esquema de alambrado de ajuste FM

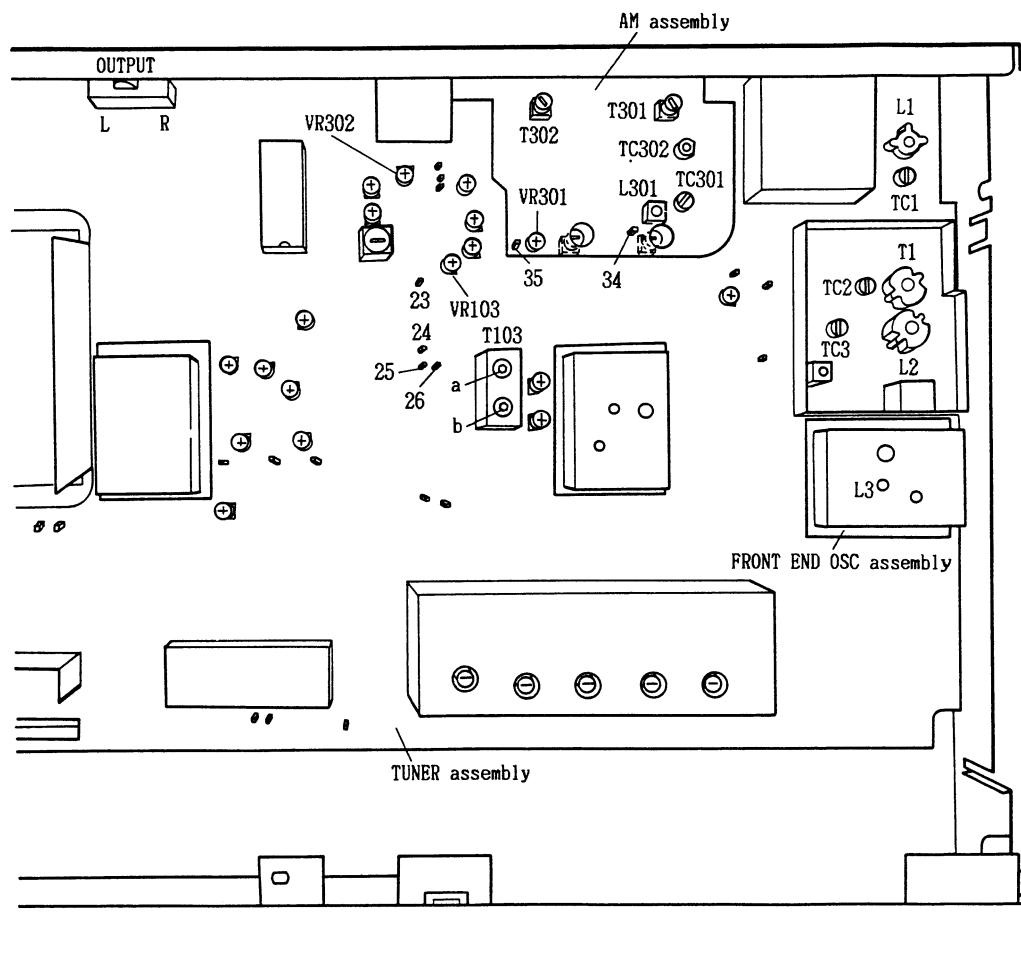
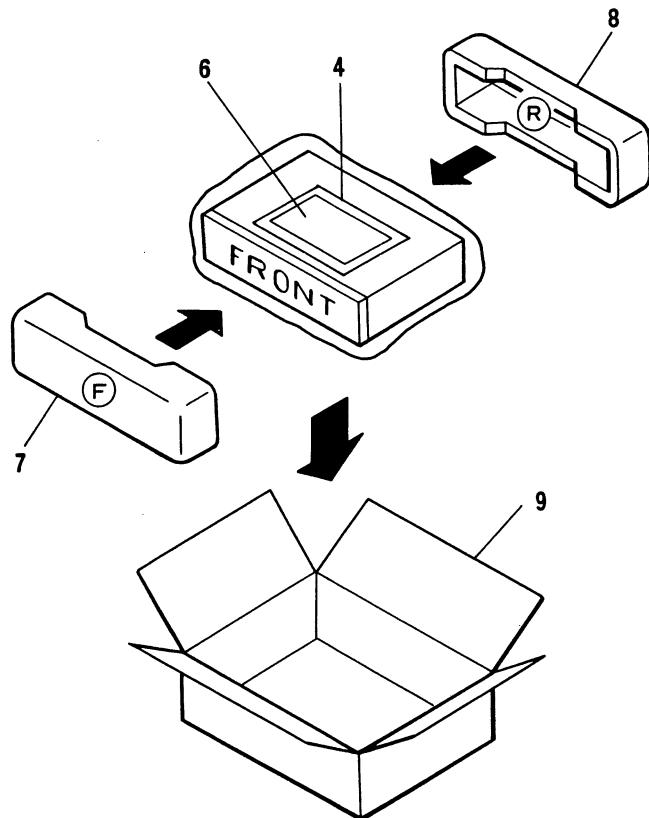
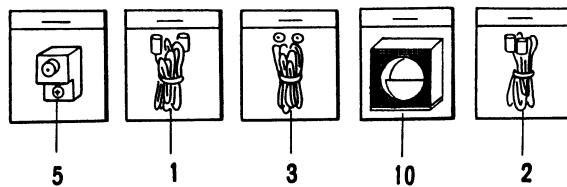


Fig. 7-3 Punto de ajuste

8. PACKING

Parts List

Mark	No.	Part no.	Description
1	ADE-081		Connector cord with pin plug
2	ADE-085		Connector cord with mini plug
3	ADH-005		FM antenna
4	AHG-153		Catalog bag
5	AKX-080		Antenna adaptor
6	ARB1075		Operating instructions (English)
7	AHA1083		Front pad
8	AHA1084		Rear pad
9	AHD1259		Packing case
10	ATB-086		Loop antenna assembly (L901)



9. IC INFORMATION

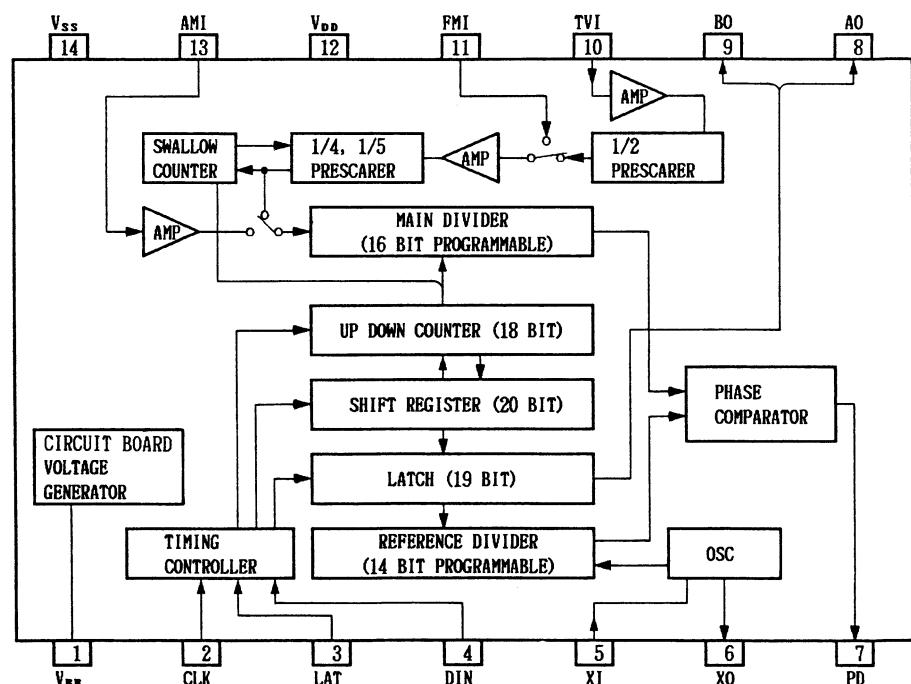
■ CX-7925B

TV/FM/AM frequency synthesizer PLL IC

• Pin Functions

Pin	Pin name	Function & Operation
1	V_{BB}	Circuit board terminal
2	CLK	Clock input for 20 bit series data input
3	LAT	Latch signal input of shift register input and Up/Down clock input
4	DIN	Data input and Up/Down mode change ("H" level:Up, "L" level:Down)
5	XI	Crystal oscillator connect terminal for reference signal generator (Max.:13MHz, Standard:4.0MHz)
6	XO	
7	PD	Phase comparator output (3 states)
8	A0	Exite control signal output/Unlock output (E/E MOS push-pull)
9	B0	Exite control signal output/data check (E/E MOS push-pull)
10	TVI	High frequency signal input (300MHz max.) including 1/2 prescaler
11	FMI	High frequency signal input (150MHz max.)
12	V_{DD}	Power supply (+5V)
13	AMI	High frequency signal input (40MHz max.)
14	V_{SS}	Ground

• Block Diagram



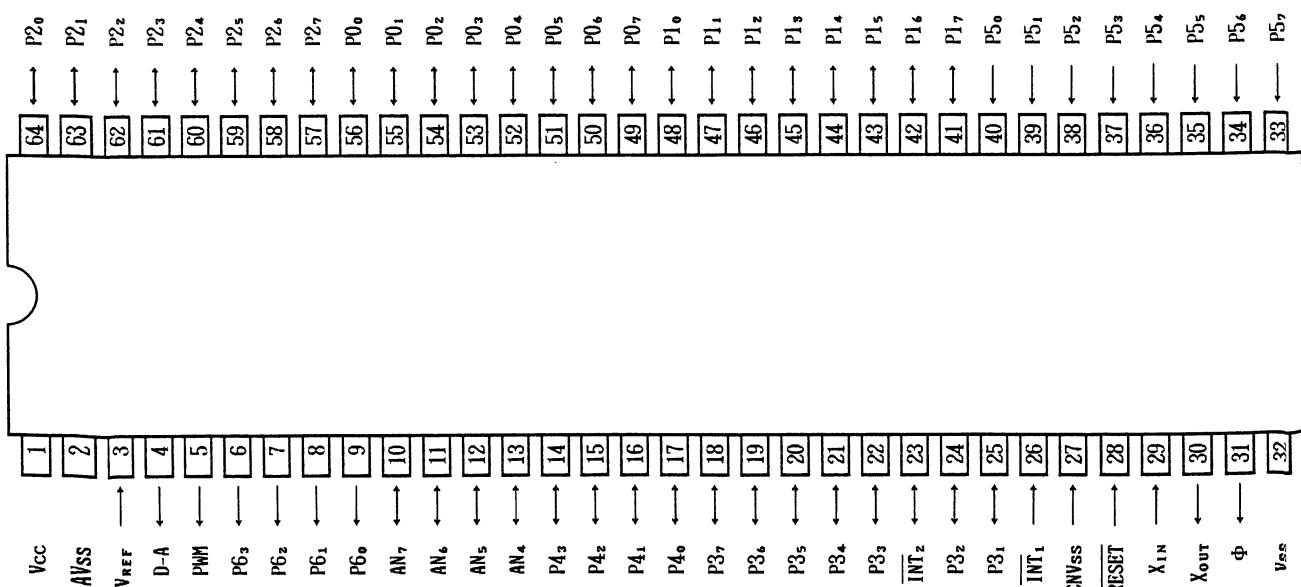
■ PD5056 (IC502)

● Pin Functions

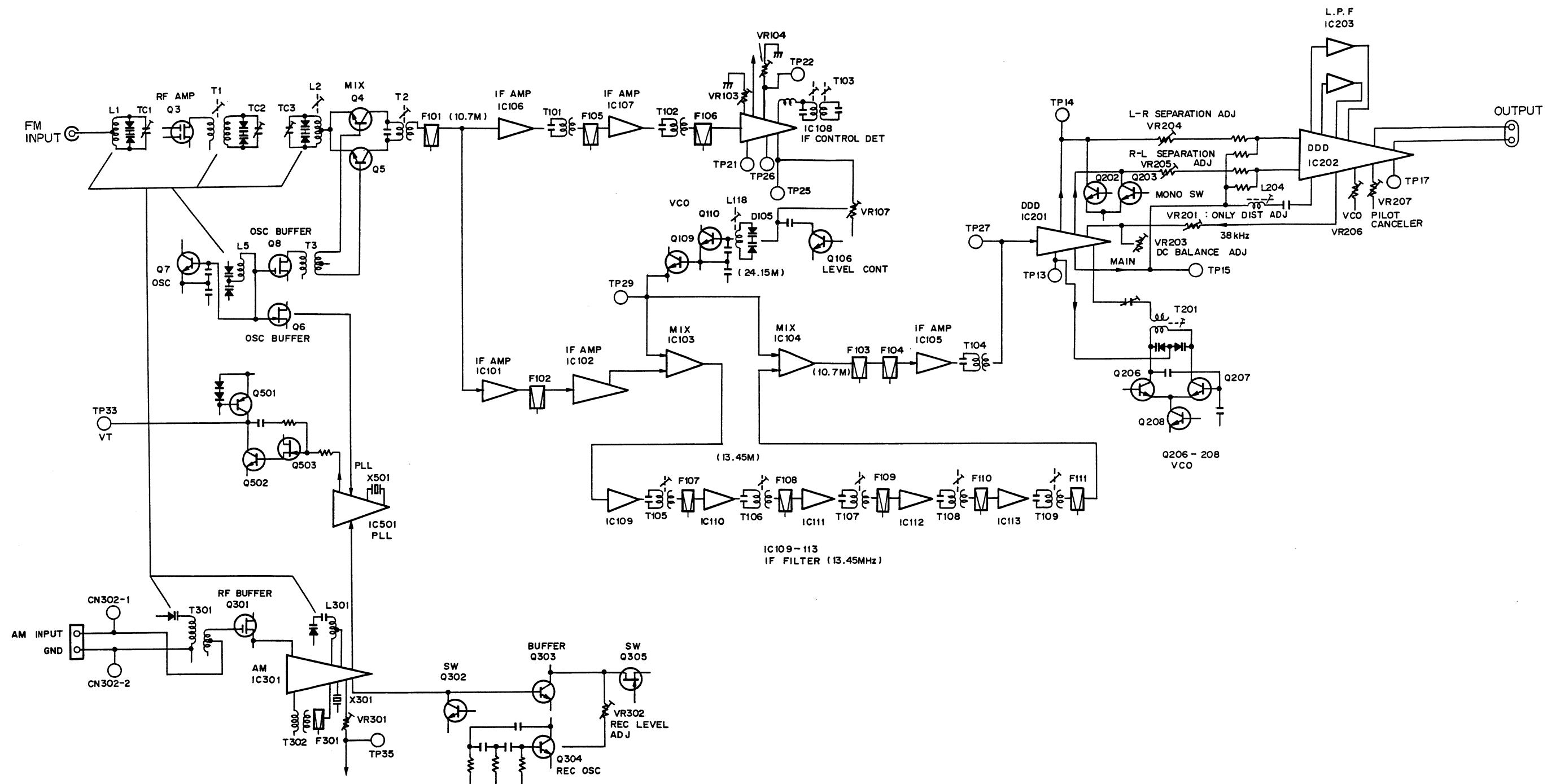
Pin	Pin name	Function & Operation	I/O	Active	Pin	Pin name	Function & Operation	I/O	Active
1	Vcc	Power supply (5V)	—	—	33	P5 ₇	KEY MATRIX INPUT	I	—
2	AVss	Analog ground (0V)	—	—	34	P5 ₆		I	—
3	V _{REF}	Reference voltage input (5V)	—	—	35	P5 ₅		I	—
4	D-A	N.C.	—	—	36	P5 ₄		I	—
5	PWM	N.C.	—	—	37	P5 ₃		I	—
6	P6 ₃	Compulsion MONO	N	H	38	P5 ₂		I	—
7	P6 ₂	VCO KILLER (AM ON)	N	H	39	P5 ₁		I	—
8	P6 ₁	Hi-Blend	N	H	40	P5 ₀		I	—
9	P6 ₀	MUTE CONTROL	N	H	41	P1 ₇	S METER display (LSB)	N	L
10	AN ₇	FM S METER ② (A/D)	I	—	42	P1 ₆		N	L
11	AN ₆	FM S METER ① (A/D)	I	—	43	P1 ₅		N	L
12	AN ₅	O-VOLT MUTE (A/D)	I	—	44	P1 ₄		N	L
13	AN ₄	AM S METER (A/D)	I	—	45	P1 ₃		N	L
14	P4 ₃	9k/10k input (H=10k)	I	—	46	P1 ₂		N	L
15	P4 ₂	AM & REC CHECK CUT (AM or REC CHECK → H)	N	H	47	P1 ₁		N	L
					48	P1 ₀		N	L
16	P4 ₁	REC LEVEL CHECK	N	H	49	P0 ₇	LEVEL ADJ.CONT (O-VOLT MUTE ON=L)	N	L
17	P4 ₀	N.C.	N	H	50	P0 ₆	KEY MATRIX OUTPUT	I	L
18	P3 ₇	MW +B CONTROL	N	H	51	P0 ₅		N	—
19	P3 ₆	ANTENNA A/B (A → H)	N	H	52	P0 ₄		N	—
20	P3 ₅	STEREO information (L-STEREO)	I	—	53	P0 ₃		N	—
21	P3 ₄	LPF CONT (OV MUTE ON=H)	N	H	54	P0 ₂		N	—
22	P3 ₃	STEREO IND.	N	L	55	P0 ₁		N	—
23	INT ₂	Interrupt for back up (AC input)	I	—	56	P0 ₀		N	—
24	P3 ₁	N.C.	N	L	57	P2 ₇	FM +B CONTROL	0	H
25	P3 ₀	Remote control data input	I	—	58	P2 ₆	PLL lock	—	—
26	INT ₁	(5V Pull Up)	—	—	59	P2 ₅	FL blank ("L" at Power ON)	0	H
27	CNVss	GND	—	—	60	P2 ₄	LC7570 (No.2) enable line	0	—
28	RESET	Power ON reset	I	L	61	P2 ₃	LC7570 (No.1) enable line	0	—
29	X _{1N}	Oscillator input (f ₀ = 4MHz)	I	—	62	P2 ₂	PLL enable line	0	—
30	X _{out}	Oscillator output	0	—	63	P2 ₁	Data line for serial data translator	0	—
31	Φ	N.C.	—	—	64	P2 ₀	Clock line for serial data translator	0	—

I : CMOS INPUT 0 : CMOS OUTPUT N : Nch OPEN

● Pin connections (Top view)



10. BLOCK DIAGRAM



11. CIRCUIT DESCRIPTION

11.1 New IF system principle

Fig.11-1 (a) shows the conventional IF system which band is wide position, and Fig.11-1 (b) shows the new IF system.

Vertical line indicates the time variable of desired signal.

The line at right side of desired signal indicates undesired signal.

Mountainous curve shows the amplitude characteristic of IF filter.

In the case of conventional system, signal pass through the filter without generate the distortion so that filter is wide. At this time, the system is affected by undesired signal.

In the case of new system, signal pass through directly so that narrow filter follow the signal. Besides, the system is not affected by undesired signal.

This system's filter is controlled by feedforward control, therefore, stability is very high and not oscillation.

This system organize the equivalent follow type filter so that input FM signal frequency controlled for center of the filter at any time. (At conventional system, filter is followed the input signal.)

Fig.11-2 shows the block diagram. System is consists of the control block and filter block. Control block is consists of band-pass filter (BPF1), FM detector (DET1) and low-pass filter (LPF).

The band-pass filter (BPF1) has the same characteristic as conventional tuner's narrow filter, and this filter has selective characteristic sufficiently.

When FM signal is inputed, FM signal is detected by FM detector (DET1) after pass through the band-pass filter (BPF1). And then, output signal of FM detector (DET1) is cut the useless high-frequency elements by low-pass filter (LPF).

Filter block is consists of two mixer (MIX1 and 2), band-pass filter (BPF2) and VCO.

Mixer 1 (MIX1) perform frequency change so that multiply input FM signal by VCO output.

F-91 introduce the secondary IF frequency as 13.45 MHz.

Band-pass filter (BPF2) has the same narrow bandwidth characteristic as the band-pass filter (BPF1).

This filter (BPF2) cut the obstruction wave including input signal.

Input signal of passed through the band-pass filter (BPF2) is multiplied by VCO output at mixer (MIX2) again, then change to the original frequency.

Original signal is detected by FM detector (DET2), then audio output is obtained.

In this way, in spite of use the filter of fixed the center frequency, F-91 operate to the variable filter so that center frequency follow the input signal as equivalent.

If desired signal (S) and undesired signal (U) apply to input as shown in Fig.11-2, first, these signals are applied to control block, and cut the undesired signal (U) by BPF1. At this time, desired signal is distorted by BPF1.

This desired signal without undesired signal is detected by FM detector (DET1), then changed the FM waveform by VCO again.

Output signal of VCO is sum of the desired signal (S) and the distortion element (D).

This distortion element (D) not only include generated distortion at filter (BPF1) but also include generated distortion at detector and VCO.

On the other hand, desired signal (S) and undesired signal (U) apply to the filter block, then mix with the VCO output. Direction of desired signal's modulation is same way as input signal.

The differential element is took out from mixer 1 (MIX1)'s output by BPF2. At this time, desired signal (S) is vanished and undesired signal (U) is eliminated by BPF2.

Therefore, only distortion element (D) pass through the BPF2.

When distortion element (D) pass through the BPF2, element (D) hardly distort so that frequency deviation of the distortion element (D) is just a little.

And signal is mixed with VCO output by mixer 2 (MIX2) and pick up the differential element again. Then, desired signal (S) is obtained to not distortion. At this time, undesired signal (U) has eliminated.

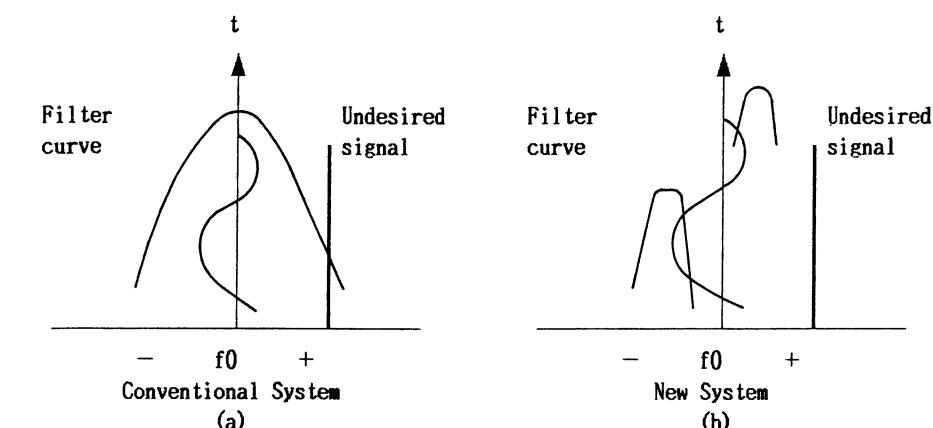


Fig.11-1 Signal tracing characteristics

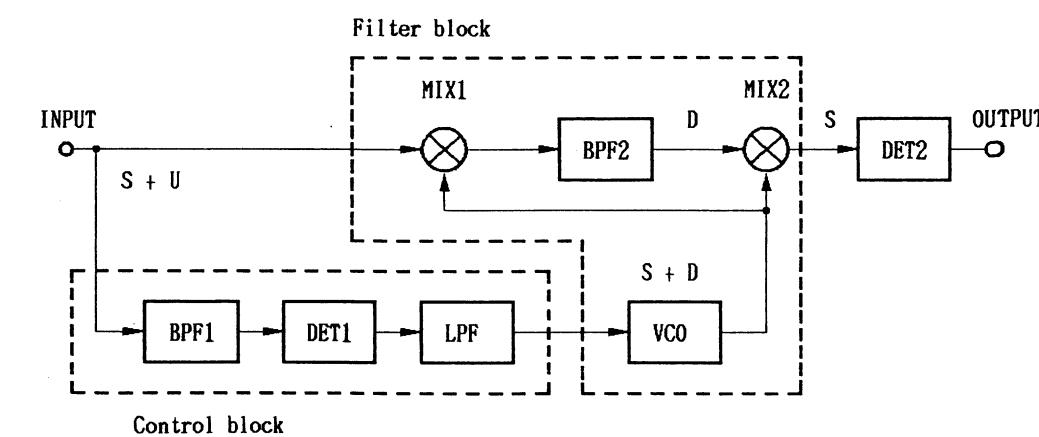


Fig.11-1 Blockdiagram of Active Real-time Tracing System

12. FOR HE, HB, HEZ AND SD/G TYPES

NOTES:

- Parts without part number cannot be supplied.
 - Parts marked by “◎” are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
 - The △ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
 - For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.
- ★★ GENERALLY MOVES FASTER THAN ★
This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Contrast of Miscellaneous Parts.

The F-91/HE, HB, HEZ and SD/G types are the same as the F-91/KU/CA type with the exception of the following sections.

Mark	Symbol & Description	Part No.					Remarks
		F-91/KU/CA type	F-91/HE type	F-91/HB type	F-91/HEZ type	F-91/SD/G type	
△	TUNER assembly	AWZ1568	AWZ1567	AWZ1567	AWZ1566	AWZ1569	
	REMOCON assembly	Non supply	.....	.....	.....	Non supply	
	Acrylic panel	AAK1298	AAK1303	AAK1303	AAK1303	AAK1298	
	FL filter	AAK1300	AAK1299	AAK1299	AAK1299	AAK1300	
	Connection cord with Mini plug	ADE-085	.....	.....	.....	ADE-085	
	AC power cord	ADG-088	ADG1021	ADG-063	ADG1010	ADG-088	
	FM antenna	ADH-005	.....	.....	.....	ADH-005	
	FM antenna assembly	.....	ADH1002	ADH1002	ADH1002	.....
	Antenna adaptor	AKX-080	.....	.....	.....	AKX-080	
	Side board L	AMS1015	AMS1019	AMS1015	AMS1019	AMS1015	
△ ★	Side board R	AMS1016	AMS1020	AMS1016	AMS1020	AMS1016	
	Operating instructions (English)	ARB1075	.....	ARB1075	.....	ARB1075	
	(English / German / French / Italian)	.....	ARE1054	.....	.....	.....
	(German)	.....	.....	.....	ARC1051	.....
	(Spanish)	.....	.....	.....	.....	ARC1068	
	Power transformer (T901) (AC120V)	ATT1043	.....	.....	.....	.....
△ ★	(AC220/240V)	.....	ATT1045	ATT1045	ATT1045	.....
	(AC110/120-127/220/240V)	.....	.....	.....	.....	ATT1044	
	Screw	.....	.....	.....	ABA1035	.....	For 2P pin-jack
	Spacer	.....	.....	.....	.....	AHB1021	For packing
	Packing case	AHD1259	AHD1259	AHD1259	AHD1259	AHD1260	For packing

TUNER Assembly

The TUNER assembly AWZ1567 (HE and HB types), AWZ1566 (HEZ type) and AWZ1569 (SD/G type) are the same as the AWZ1568 (KU/CA type) with the exception of the following sections.

Mark	Symbol & Description	Part No.				Remarks
		AWZ1568	AWZ1567	AWZ1566	AWZ1569	
	C215, C216 R178 R214, R215 R408 (2.2MΩ, 1/2W) R420, R421	CQMXA242J100 RD1/8PM822J RN1/4PQ3162F ACN-209 RS1LMF181J	CQMXA182J100 RD1/8PM473J RDR1/4PM303J	CQMXA182J100 RD1/8PM473J RDR1/4PM303J	CQMXA182J100 RD1/8PM473J RDR1/4PM303J	
	R422 R530 Pal socket C3 (0.01/25V) C3, C42	RS2LMF181J RD1/8PM102J ACG-036 .....	..... ..... AKX1013 ACG-036 .....	..... ..... AKX1013 CCDCH150J50	..... RD1/8PM102J ACG-036	
	C41 C43 C267, C268 (0.01/25V) C270, C271 L2 FM RF coil	..... ..... ..... ..... ATC-205	..... ..... ..... ..... ATC-205	CCCSL101J50 CKDYX104M25 ACG-036 CQSXA152J160 .....	..... ..... ..... ..... ATC-205	
	L206, L207 L208, L209 L401 Line filter R33 T4 FM RF transformer	..... ..... ..... ..... .....	..... ..... ..... ..... .....	LAU2R2M LAU101K ATF-151 RD1/8PM472J ATC-257	..... ..... ..... ..... .....
★★	Q210, Q211 R259, R260	.....	.....	.....	2SK161 RD1/8PM105J	
★★	S501 Slide switch (CHANNEL STEP/FM DE-EMPHASIS)	.....	.....	.....	ASH1009	
▲★★	S902 Voltage selector (AC110/120-127/220/240V)	.....	.....	.....	AKX-505	
	C265, C266 R34	..... RD1/2PM103J	..... .....	..... .....	CQMA821J50	